

Vacuum-Compatible Multi-Axis Manipulator/Machining Center for Long-Duration Space Missions, Phase II

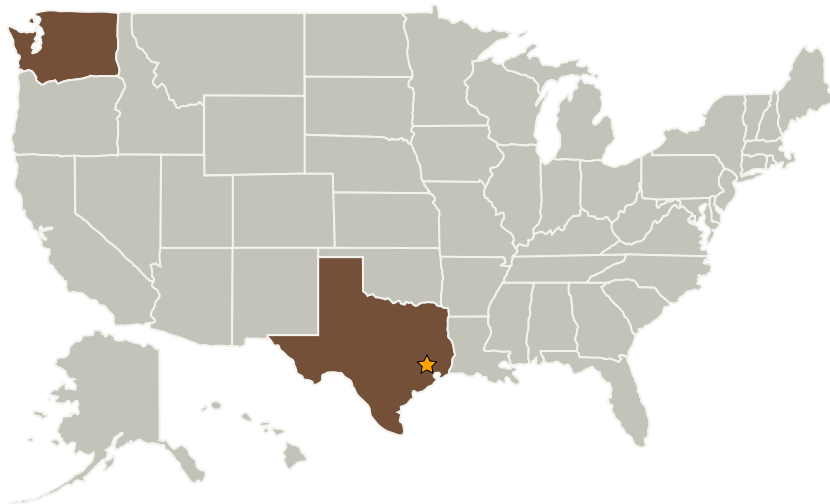
Completed Technology Project (2008 - 2010)



Project Introduction

NASA has many needs for maintenance and repair technologies for long-duration human space missions. We propose to continue developing a compact, portable, vacuum-compatible, multi-axis Manipulator/Machining Center (M/MC) to satisfy many of NASA's needs. Our M/MC will provide complex manipulation during: layer-additive manufacturing; collection of geometric data for reverse-engineering; real-time non-destructive evaluation; and non-destructive material property determination. Our M/MC will also finish-machine near-net-shape parts produced using layer-additive manufacturing. Design features of our M/MC will: minimize mass, volume, and power consumption while providing required capabilities; maximize life and reliability; and enable our M/MC to operate in space-based vacuum, microgravity, and partial-gravity environments. In Phase II, we will: generate alternative designs of M/MCs for space-based applications; and design, build, test, and zero-g-flight-test a prototype M/MC. In Phase III, we will design, build, and sell M/MCs to the government and private sector.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Beck Engineering, Inc.	Supporting Organization	Industry	Port Orchard, Washington



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

Texas

Washington

Project Transitions



June 2008: Project Start



June 2010: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.4 Manufacturing
 - └ TX12.4.5 Nondestructive Evaluation and Sensors